

REMARKSI. Introduction

In response to the Office Action dated October 4, 2002, claims 1, 9, 11, 19, 33, 41, 43 and 51 have been amended and new claims 65-76 have been added. Claims 1-76 are in the application. Re-examination and re-consideration of the application, as amended, is requested.

II. Non-Art Rejections

On page 2 of the Office Action, claims 1-64 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Applicants' attorney has amended claims 1 and 33 to overcome some of these rejections, but nonetheless traverses others of the rejections. Specifically, Applicants' attorney respectfully submits that there is none of the rejections are proper, that there is nothing indefinite about Applicants' claims, and therefore requests that the rejections be withdrawn.

III. Prior Art RejectionsA. The Office Action Rejections

On page 3 of the Office Action, claims 1-64 were rejected under 35 U.S.C. §102(b) as being anticipated by Welch et al., U.S. Patent No. 5,539,571 (Welch).

Applicants' attorney respectfully traverses these rejections in light of the amendments above and the arguments below.

B. Applicants' Independent Claims

Applicants' independent claim 1 is directed to a method of making diode laser assembly, comprising:

providing a substrate;

forming an epitaxial structure on the substrate, the epitaxial structure having optically active and optically inactive areas;

forming a laser in the epitaxial structure, the laser producing a tunable laser output; and

forming an amplifier in the epitaxial structure, at least a portion of the laser and amplifier sharing a common waveguide, the tunable laser output being coupled to the amplifier along the common waveguide, and the amplifier generating an optical signal in response to the coupled

A

tunable laser output, wherein at least a portion of the waveguide is curved and the waveguide intersects an output facet at an oblique angle.

Applicants' independent claim 33 is also directed to a method of making a diode laser assembly, comprising:

- providing a substrate;

- forming a first semiconductor layer and a second semiconductor layer in an epitaxial structure having optically active and optically inactive areas, the first and second semiconductor layers having different dopings; and

- forming a first waveguide layer between the first and second semiconductor layers, the first waveguide layer including a waveguide, a first reflector and a second reflector;

- forming an optically active medium disposed between the first and second reflectors, the first and second reflectors defining a laser cavity and producing a tunable laser output; and

- forming an amplifier in the epitaxial structure, wherein the laser cavity and the amplifier are optically aligned, the tunable laser output being coupled into the amplifier along the waveguide, and the amplifier generating an optical signal in response to the coupled tunable laser output, wherein at least a portion of the waveguide is curved and the waveguide intersects an output facet at an oblique angle.

C. The Welch Reference

Welch describes an optical amplifier semiconductor device which is differentially pumped and a master oscillator power amplifier (MOPA) device employing such an amplifier. The amplifier allows the light propagating therein to diverge along at least part of its length, and may be a flared amplifier having a gain region that increases in width toward its output at a rate that equals or exceeds the divergence of the light. The amplifier is pumped with a current density at its input end which is smaller than the current density used to pump the output end for maintaining coherence of the beam to high power levels. Differential pumping may be both longitudinal and lateral within the amplifier. A single mode preamplifier section may be optically coupled to the input end of the amplifier. The amplifier input may have a width which is the same as or wider than that of the preamplifier output. The preamplifier may have a constant mode width or may be tapered to alter the divergence of the beams provided to the amplifier section. The laser oscillator in the MOPA device may be a single mode DBR laser diode monolithically integrated on the same substrate as the optical amplifier. Laser sources external to an amplifier chip may also be used. The input portion of

A

the amplifier or the preamplifier section, if present, may be modulated. The laser oscillator might also be modulated if it has a high Q cavity. Tunable laser oscillators are also disclosed.

D. Applicants' Claimed Invention Is Patentable Over The References

Applicants' attorney respectfully submits that Applicants' claimed invention is patentable over the Welch reference. Specifically, Applicants' attorney asserts that the references, taken individually or in combination, do not teach or suggest the structure recited in Applicants' independent claims 1 and 33. Instead, the reference describes a device having a different structure, which is made by different steps.

Welch does not show at least a portion of the waveguide being curved and the waveguide intersecting an output facet at an oblique angle. The oblique intersection with the output facet reduces unwanted reflections back into the laser cavity, and the curved waveguide allows the majority of the device to have an axis aligned with a desired crystal axis for improved optical properties that is perpendicular to the facet. In contrast, Welch describes a device of significantly different structure, which is made by means of different process steps.

Moreover, none of the other references cited in the Office Action overcome the deficiencies of Welch.

Thus, Applicants submit that independent claims 1 and 33 are allowable over Welch. Further, dependent claims 2-32 and 34-74 are submitted to be allowable over Welch in the same manner, because they are dependent on independent claims 1 and 33, respectively, and thus contain all the limitations of independent claims 1 and 33. In addition, dependent claims 2-32 and 34-74 recite additional novel elements not shown by the references.

IV. Conclusion

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited.

A

Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicants' undersigned attorney.


Respectfully submitted,

GATES & COOPER LLP

Attorneys for Applicants

Howard Hughes Center
6701 Center Drive West, Suite 1050
Los Angeles, California 90045
(310) 641-8797

Date: January 3, 2003

By: 
Name: George H. Gates
Reg. No.: 33,500

GHG/sjm/io

G&C 122.32-US-I1

FAX RECEIVED

JAN 03 2003

TECHNOLOGY CENTER 2800

A